

Catalytic Wet Peroxide Oxidation of 1,4-Dioxane with Cu Catalysts

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1,4-Dioxane has recently been found in Korea near the river of the chemical plants which synthesize polyester fiber from terephthalic acid and ethylene glycol. During the reaction 1,4-dioxane was produced as the main byproduct owing to the condensed dimerization of the excess ethylene glycol as shown below :

1,4-Dioxane causes liver damage and kidney failure, has been known to be carcinogenic to animals, and is a potential carcinogen for humans(U.S. DHHS, 1994) and, hence, is classified as a hazardous waste and a priority pollutant.

Catalytic wet oxidation has been the subject of numerous investigations to reduce the amount of pollutants in wastewater(Lee et al, 200; Levec et al, 1995). Catalytic wet peroxide oxidation with H₂O₂(CWPO) is a more efficient process due to the strong oxidizing properties of hydrogen peroxide, and therefore the reaction is performed in mild conditions.

In the present work CWPO of 1,4-dioxane was carried out in a batch reactor. Cu powder and Cu plate were used as the catalysts.